Comprehensive Development and Debug Coverage for Linux and Android on the MIPS Architecture

Presented by MIPS Technologies

Powering a Connected World

October 2010

Today's presenters:

- **Rick Leatherman**
  VP Development Tools MIPS Technologies
- **Hieu Tran**
  President & Founder of Viosoft Corporation
- **Art Lee**
  VP of Business Development, Viosoft Corp.

MIPS Technologies
Powering a Connected World

MIPS TECHNOLOGIES

At the core of the user experience.®

Agenda

- Android and its Migration to Non-mobile Applications
- Android and How It Compares to Traditional Linux Systems
- The Challenges of Debugging Android
- The Limitations of Traditional Debug Tools
- Viosoft Arriba Debugger Overview
- Brief Debug Demonstrations
- Android System Event Analyzer
- Summary
- Q & A

Overview of Google Android™ Software Platform

Taking Android beyond Mobile Handsets

At the core of the user experience.®

Android on Non-Mobile Platforms

At the core of the user experience.®

HANDSET (99% COMPLETE)

Assuming HW and Linux SW is *EXACTLY* the same
Otherwise…only 80% or less

MID (70%)

STB (50%)

Embedded Device (???)

Android Enables Embedded Devices to Access the “Cloud”

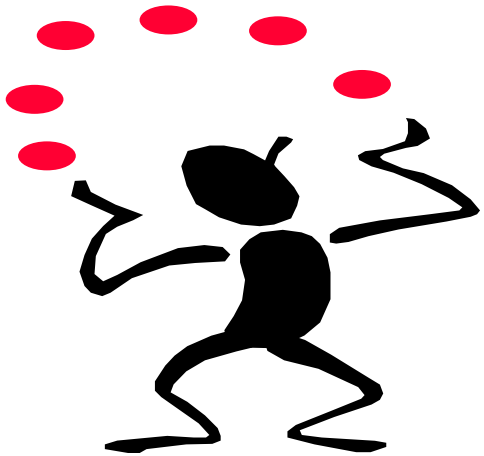
Devices to experience connected content NOW

Repurposing Android Requires Tools that can Debug the Full Stack

MIPS' licensees, partners, and the community will contribute much of the longer-term effort

Android versus Traditional Linux Systems

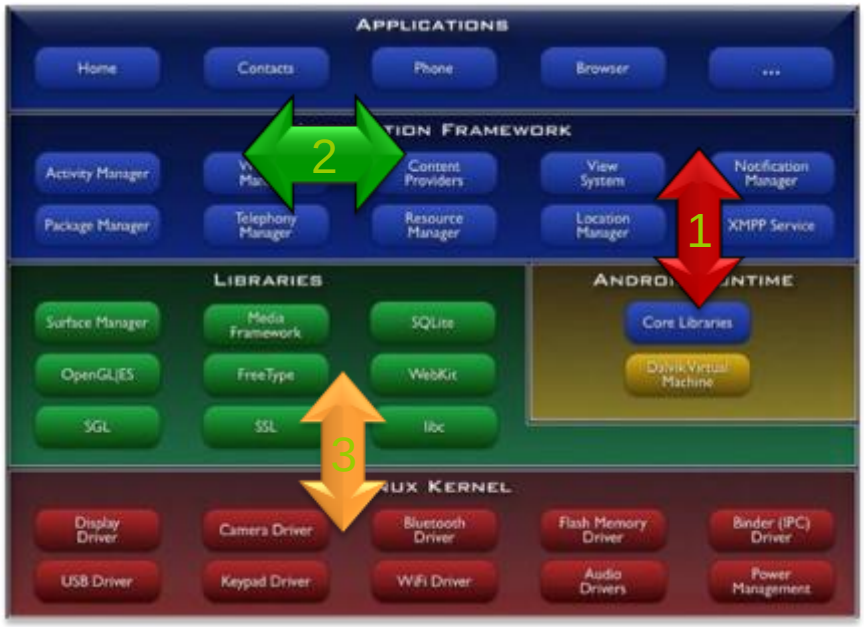
Traditional Linux Platforms	Android
Single language (some assembly, mostly C)	Multiple languages (assembly, C/C++, Java, JavaScript, ActionScript)
Single/few processes	Multiple processes, with program logic straddling process barriers
Applications mostly execute in User Space	Applications partitioned between User and Kernel Space
One process per application	Multiple processes per application



Android Software Development
Android is a Juggling Act!

Why is Android Development so Difficult?

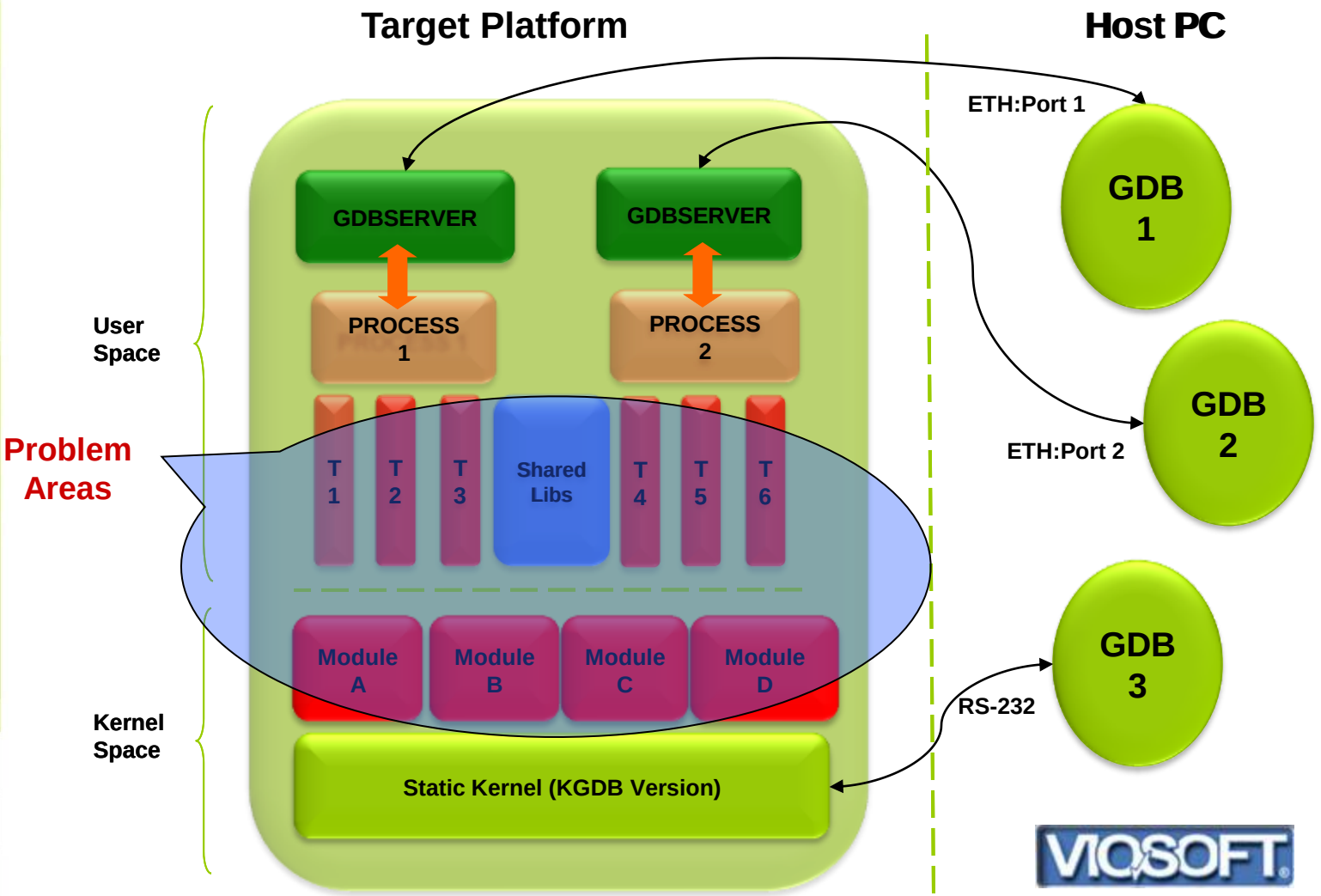
- **(1) Android applications cross language barrier**
  - Java
  - C/C++
  - Javascript & Actionscript
- **(2) Android applications cross process barrier**
  - Client/Server
  - JNI
  - CORBA/IDL
- **(3) Android applications cross protection barrier**
  - To and From User / Kernel Space



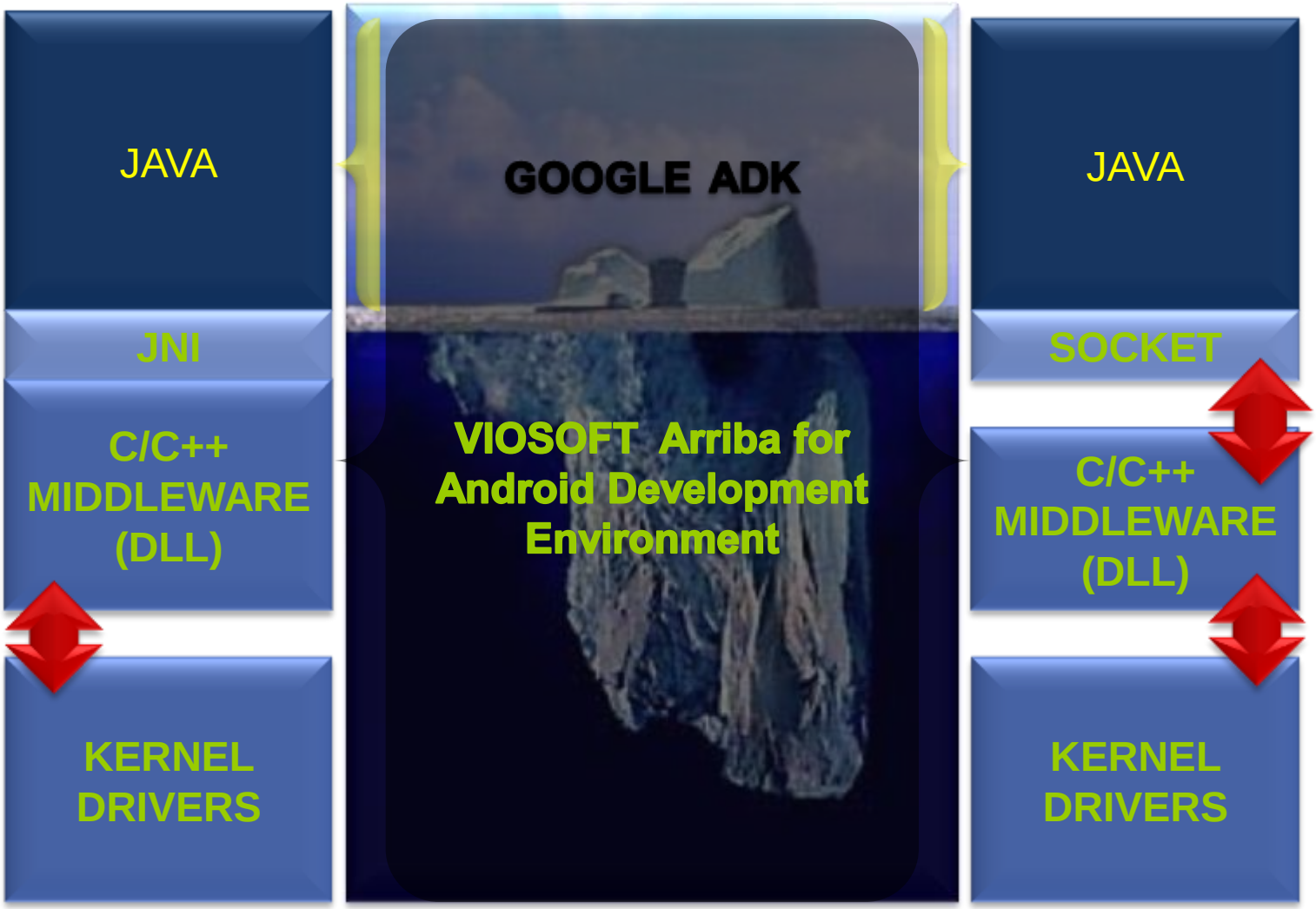
MIPS Strategic Alliance With Viosoft Corporation

- MIPS has partnered with Viosoft to offer the Arriba embedded Linux/Android debugger as part of the MIPS tools portfolio
- The Arriba debugger offer a very unique and powerful set of debug features
- Recently awarded a “Best in Show” Award by VDC for Android Development Tools
- We will showcase the Arriba debugger during today’s Webinar

Traditional Linux Debug Tools Like KGDB and GDBSERVER are Severely Limited



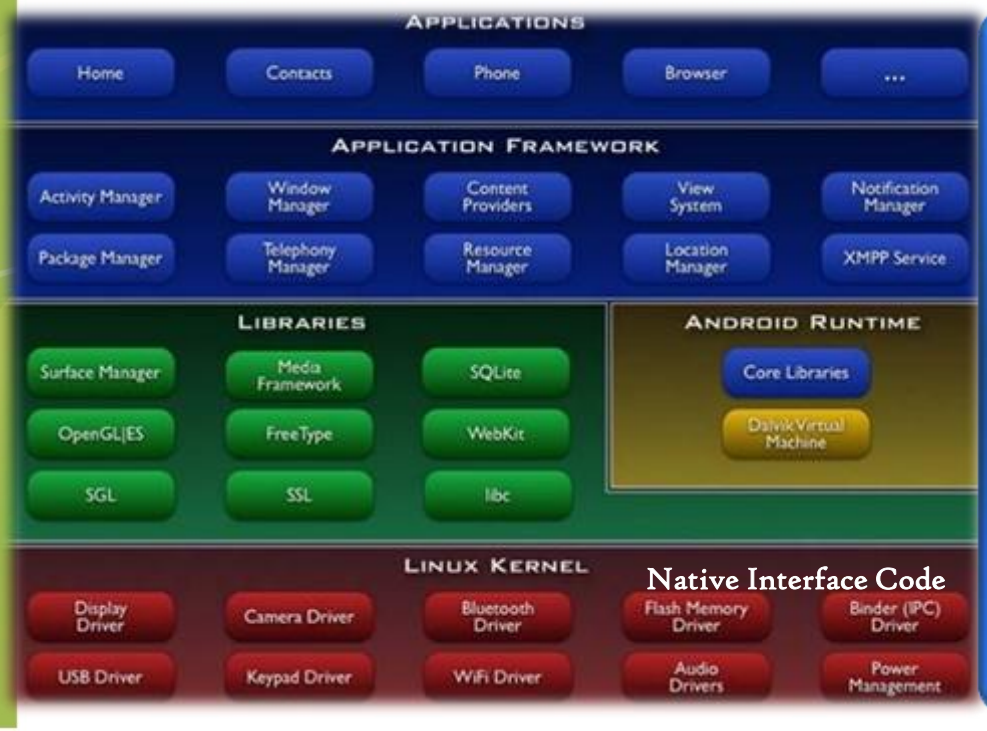
Android Application Development with the Arriba Debugger



Arriba Enhanced Android Debug Platform

At the core of the user experience.®

Target Platform



VMON

Ethernet /USB / E)TAG

Host Platform

Android SDK

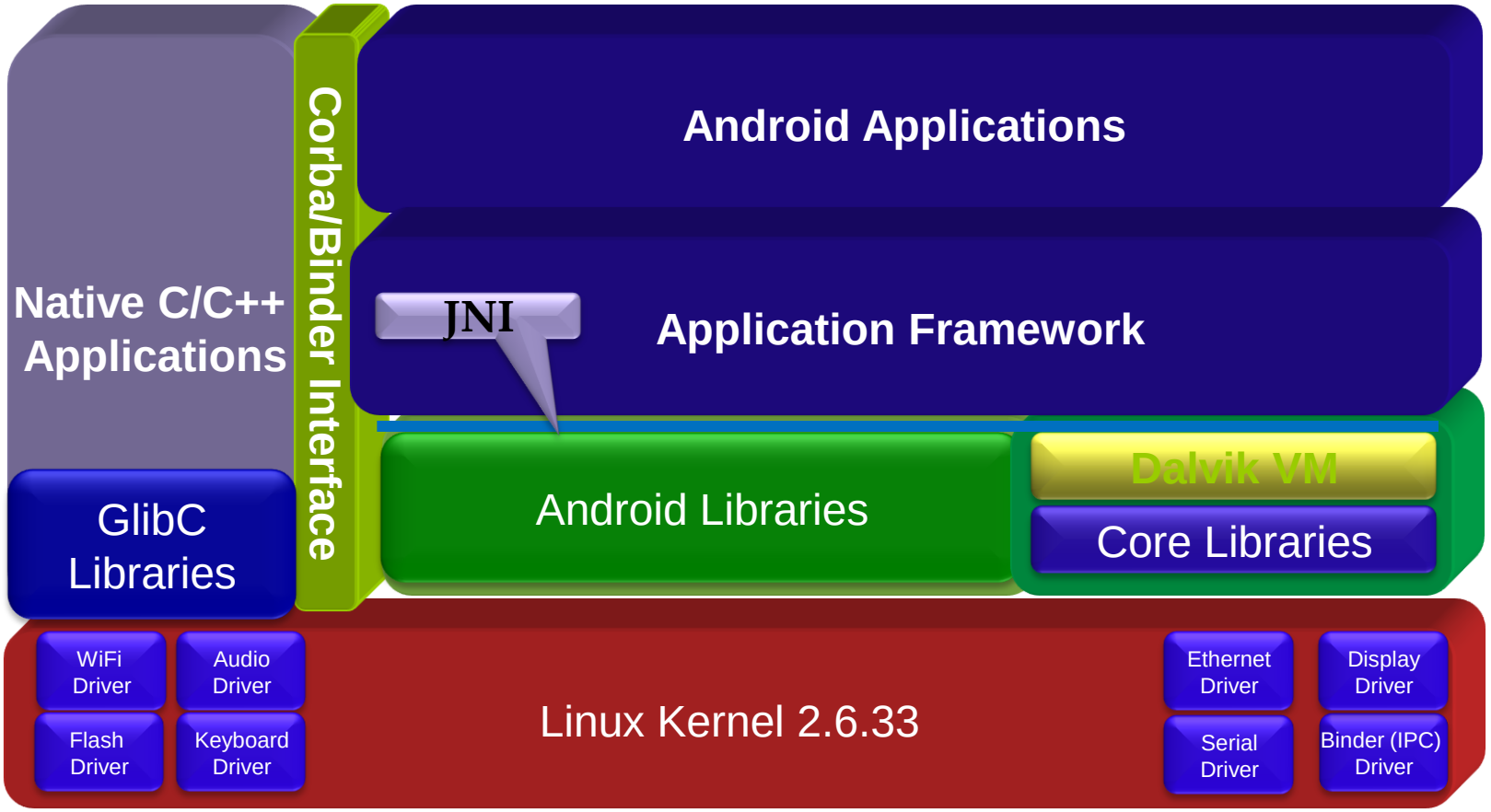
Arriba

Eclipse based Arriba SDK

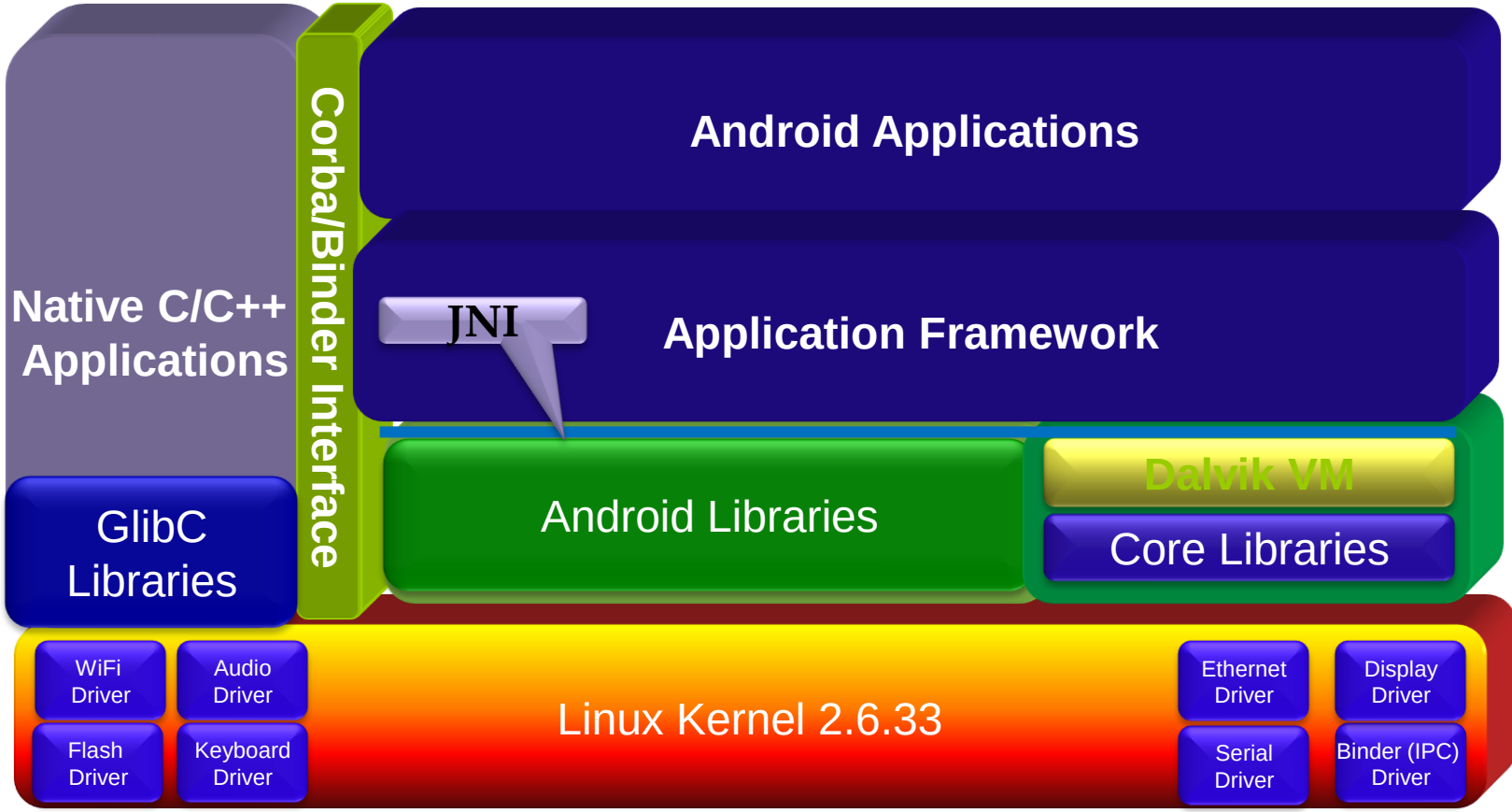
Debug Examples

- Kernel and Driver
- Dalvik Application
- Dalvik VM

Android Platform Run-mode Coverage



Linux Kernel Debug

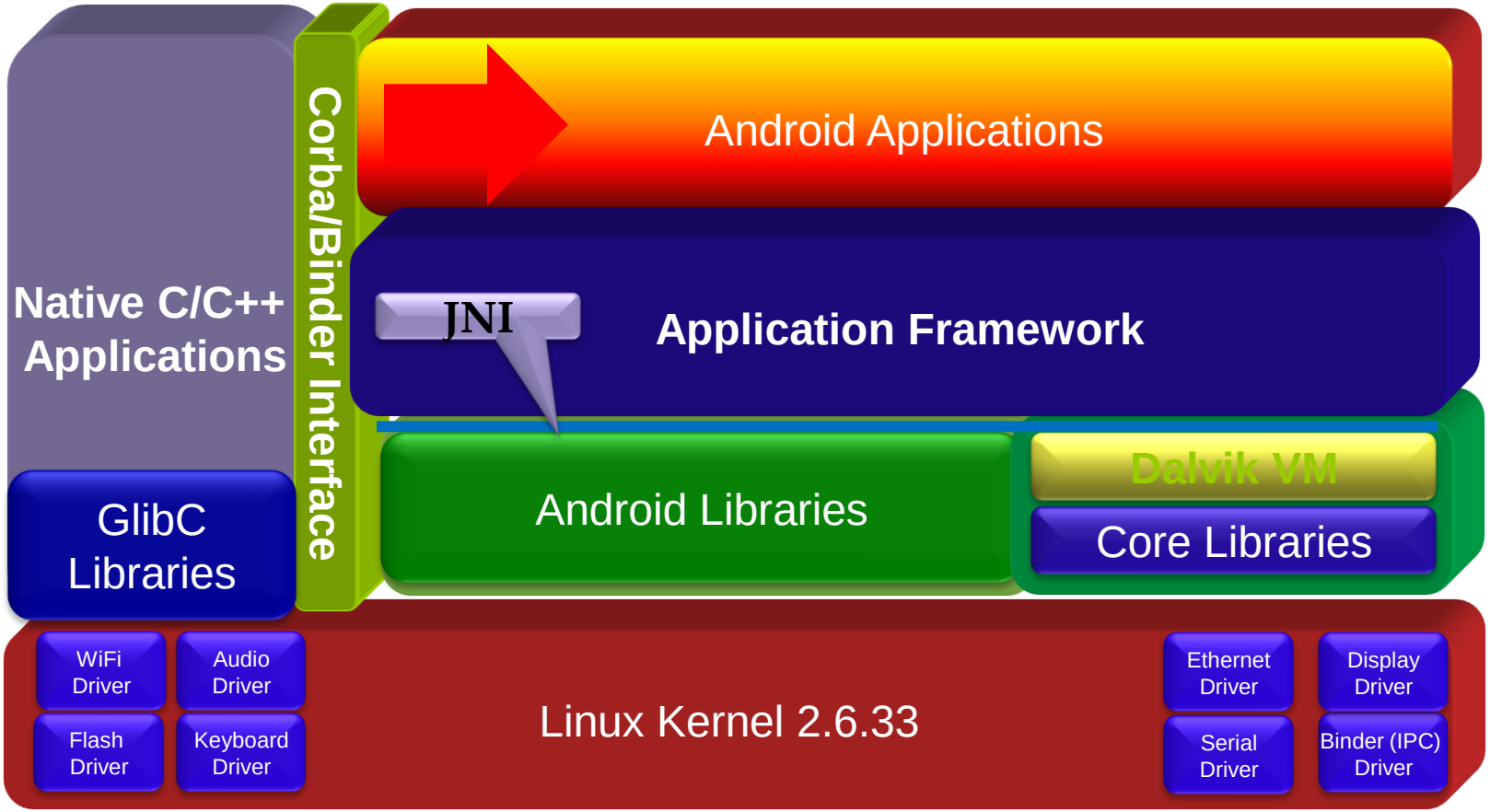


MIPS TECHNOLOGIES

At the core of the user experience.®

Insert Kernel Debug Video

Android Application Debug

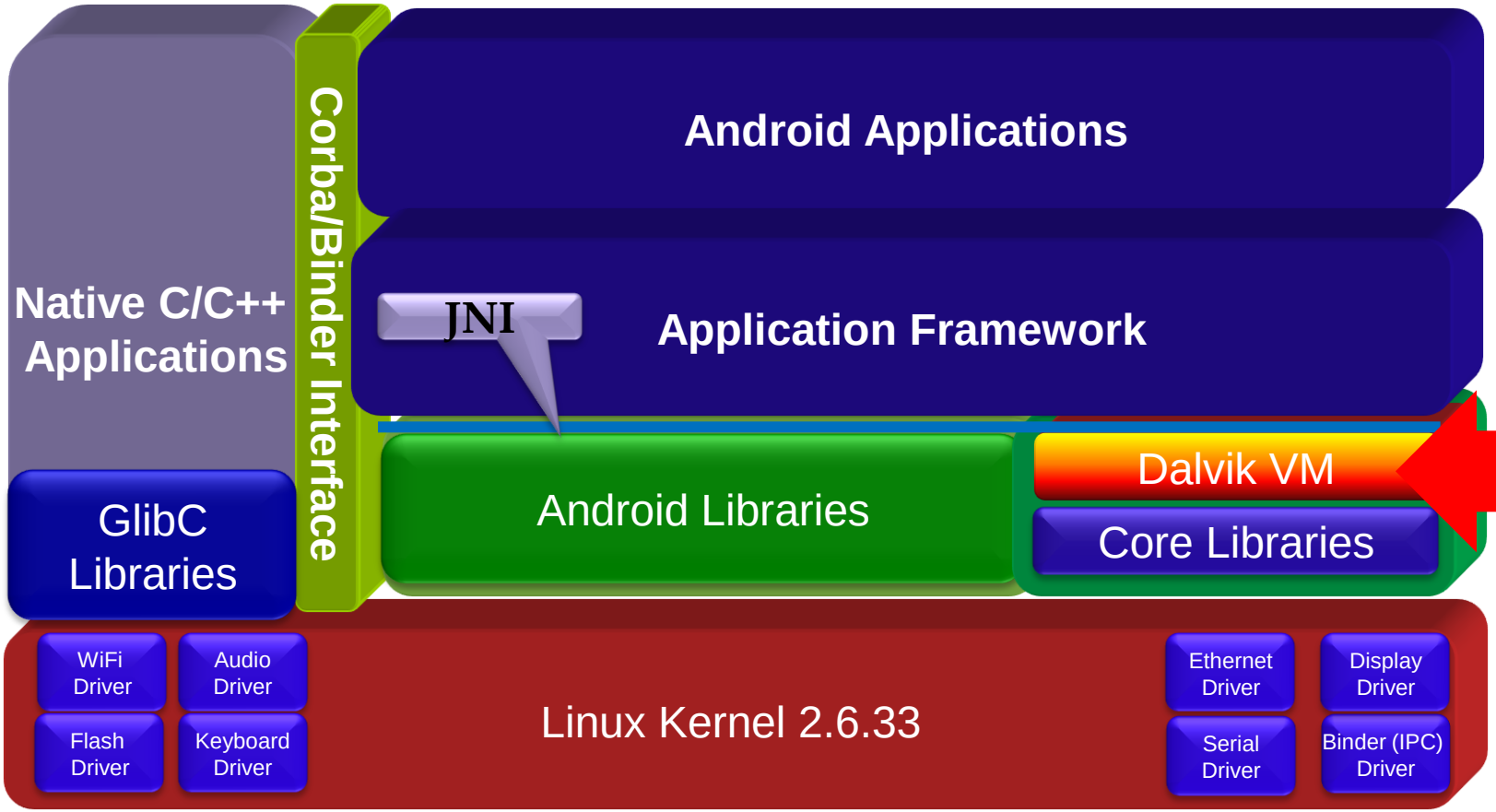


MIPS TECHNOLOGIES

At the core of the user experience.®

Insert Java Debug Video

Android VM Debug



VIOSOFT

MIPS TECHNOLOGIES

At the core of the user experience.®

Insert JVM Debug Video

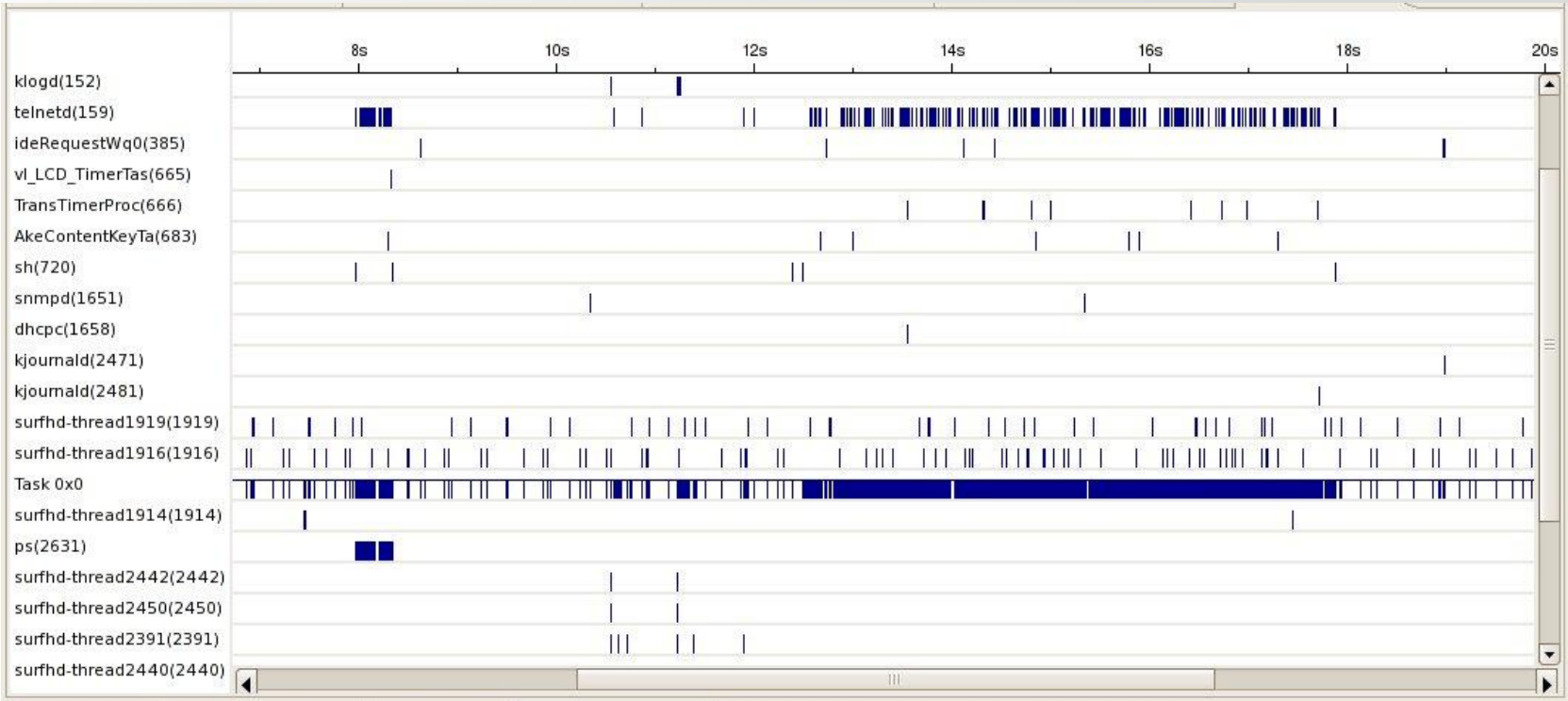
Arriba Linux/Android Event Analyzer

Innovative Tools for Analyzing Linux and Android Systems

MIPS TECHNOLOGIES

At the core of the user experience.®

Arriba Linux/Android Analysis Tool



Problems | Tasks | Console | Properties | Task Statistics

Start time (sec): 6.72100000000 End time (sec): 20.1630000000

Task	Nr. Executions	Nr. Executions/Second	Load (%)	Interrupts/Second
init(1)	0	0	0	0
Task 0x1	0	0	0	0
ksoftirqd/0(2)	0	0	0	0
Task 0x2	0	0	0	0
watchdog/0(3)	0	0	0	0
Task 0x3	0	0	0	0
events/0(4)	2	0.15	0.01	0
Task 0x4	0	0	0	0

VIOSOFT

Linux/Android Event Analyzer

- **Application level profiling**
  - Works with all MIPS-Based™ devices running Linux or Linux & Android
  - Captures all Linux/Android events occurring on the target
  - Record activity for up to 20+ seconds (or you run out of memory)
  - Display events over time with details just a mouse click away

The Power of Android

At the core of the user experience.®

- Bringing innovative technologies to customers in established markets
- Enabling new business models for service & content providers; OEMs
- Android on MIPS source code publicly available: Visit www.mips.com/android
- Contact rickl@mips.com to schedule a live Android debug demonstration

MIPS is leading the Android Revolution in the digital home

MIPS TECHNOLOGIES

At the core of the user experience.®

Thank You!

www.mips.com/android